Montana Clinical Communication & Surveillance Report

MONTANA
CARDIOVASCULAR HEALTH AND DIABETES PROGRAMS

Montana Department of Public Health and Human Services
Chronic Disease Prevention and Health Promotion Program
Room C314, Cogswell Building
PO Box 202951
Helena, Montana 59620-2951

ISSUE JULY - SEPTEMBER 2004

KNOWLEDGE OF STROKE WARNING SIGNS AND RISK FACTORS IN CASCADE AND YELLOWSTONE COUNTY, 2004

BACKGROUND:

WHAT'S INSIDE

BACKGROUND

Public health efforts to promote stroke awareness and the need to seek urgent treatment have assumed a new importance in the years since the publication of the major clinical trial showing that thrombolytic therapy could decrease short-term disability and improve outcomes for patients experiencing an ischemic stroke[1]. Achieving early stroke identification and treatment within the 3-hour window in one Texas community required a multilevel intervention, which influenced the knowledge and behavior of the public, the response of emergency medical services, and the coordination of diagnostic and treatment facilities at the hospitals[2-3]. An important component for the success of stroke interventions is improving public knowledge about stroke, particularly focusing on those at high risk along with their family members and caregivers. In 2004, we conducted a telephone survey in two counties in Montana, Cascade and Yellowstone. This report describes the level of awareness of stroke warning signs, risk factors, and the public perception of the need to call 911 emergency medical services for stroke among residents 45 years and older in two counties in Montana.

METHODS

Setting

Residents living in Cascade and Yellowstone Counties, including the cities of Great Falls and Billings, were included in the survey. In 2000, the population of Cascade County was 80,357 with 14% of the population aged 65 years and older and 23% aged 45 to 64 years old. The majority of residents were Caucasian (91%) or American Indian (4%). For Yellowstone County, the population was 129,352 with 13% aged 65 years and older and 23% aged 45 to 64 years old. The majority of residents in Yellowstone County were also Caucasian (93%) or American Indian (3%). There are three tertiary care hospitals in the two counties, and they provide comprehensive stroke diagnostic and treatment services for large multi-county catchment areas.

Telephone survey

From February through April 2004, the Montana Department of Public Health and Human Services conducted a random digit dial telephone survey of adults aged 45 years and older living in Cascade (n = 400) and Yellowstone (n = 400) Counties. Respondents were prompted to name up to three warning signs and three risk factors for stroke. They were asked to identify what they would do if they witnessed someone having a stroke, or if they experienced sudden stroke warning signs including numbness, paralysis, and speech problems that "would not go away." Respondents were asked a series of questions from the Behavioral Risk Factor Surveillance System (BRFSS) Survey to identify those individuals with a history of heart attack, angina or coronary heart disease, stroke, transient ischemic attack (TIA), atrial fibrillation, diabetes, high blood pressure, high cholesterol, and if they currently smoked cigarettes. Those who reported a history of a heart attack, angina, or coronary heart disease were classified as having a history of heart disease. Women respondents, who only had been told they had gestational diabetes, were not categorized as persons with a current diagnosis of diabetes. Respondents who reported that they smoked cigarettes everyday or some days were categorized as current smokers.

Using methods similar to those of other stroke surveys, we considered the following to be warning signs for stroke: dizziness, difficulty understanding or slurred speech, severe headache, problems with vision, weakness on one or both sides of body or face, numbness on one or both sides of body or face, and trouble walking, loss of balance, or lack of coordination[4]. And we considered high blood pressure, high cholesterol, smoking, diabetes, heavy alcohol use, history of heart disease, and a history of stroke or transient ischemic attack to be stroke risk factors.

Data analyses

Data analyses were completed using SPSS V11.5 software (SPSS Inc., Chicago, Il.). Chi-square tests were used to compare differences in respondent knowledge of two or more warning signs, two or more risk factors for stroke, and use of 911 emergency medical services by age, sex, and history of stroke risk factors. Multiple logistic regression analyses were conducted to identify demographic and self-reported risk factors independently associated with knowledge of warning signs and risk factors for stroke.

RESULTS

The mean age of respondents (N = 800) was 61 years (range 45 to 95), 60% were women, 96% were Caucasian, and 2% were American Indian. Ten percent reported a history of atrial fibrillation, 6% diabetes, 37% high blood pressure, 31% high cholesterol, 17% currently smoked cigarettes, and 40% were former smokers. Eight percent reported a history of heart disease and 6% reported a history of stroke or TIA. Overall, 80% reported one or more risk factors for stroke, and 56% reported two or more risk factors for stroke.

Table 1. Perceptions of stroke warning signs and risk factors among respondents aged 45 years and older*.

Responses	Number (%)
Warning Signs	
Numbness (any) †	360 (45)
Speech problems†	300 (38)
Do not know	306 (38)
Dizziness†	278 (35)
Headache†	204 (26)
Weakness (any)†	198 (25)
Other	174 (22)
Vision problems†	140 (18)
Shortness of breath	108 (14)
Trouble walking†	85 (11)
Risk Factors	
Overweight	445 (56)
Smoking†	400 (50)
Hypertension†	351 (44)
Lack of exercise	208 (26)
Do not know	169 (21)
Stress	155 (19)
High cholesterol†	149 (18)
Alcohol use†	101 (13)
Other	96 (12)
Family history of heart disease	58 (7)
Diabetes†	57 (7)
Family history of stroke	45 (6)
History of heart disease†	40 (5)

**Only those with at least 5% responding are listed*
†Established warning signs and risk factors

Numbness on any side of the face or body (45%) and speech problems (38%) were the most frequently reported warning signs for stroke (Table 1). Fewer respondents reported vision problems (18%) or difficulty walking (11%). Overweight (56%), smoking (50%), and hypertension (44%) were the most frequently reported risk factors for stroke (Table 1).

The majority of respondents (70%) could identify two or more warning signs for stroke (Table 2). Women (75%), and respondents aged 45 to 64 years (76%) were more likely than men (62%), and those aged 65 years and older (59%) to identify two or more warning signs for stroke, respectively. Just under half of the respondents (45%) could identify two or more risk factors for stroke. Respondents aged 45 to 64 years old (48%) were more likely to identify two or more risk factors for stroke compared to those aged 65 years and older (40%).

Adjusting for multiple factors using logistic regression analyses, women, individuals aged 45 to 64 years old, those with 12 or more years of education, and individuals with a history of high cholesterol were more likely to identify two or more warning signs for stroke compared to respondents without these characteristics (Table 3). Women and respondents aged 45 to 64 years were more likely to identify two or

Table 2. Knowledge of established stroke warning signs and risk factors, overall, and by age and sex, Montana, 2004.

	Total (N = 800) n (%)	Men (N = 322) n (%)	Women (N = 478) n (%)	Aged 45 to 64 years (N = 511) n (%)	Aged 65+ years (N = 287) n (%)
Number of warning signs					
One or more	697 (87)	272 (85)	425 (89)	461 (90)*	234 (82)
Two or more	557 (70)	200 (62)	357 (75)*	387 (76)*	169 (59)
Three	311 (39)	111 (35)	200 (42)*	225 (44)*	85 (30)
Number of risk factors					
One or more	683 (85)	262 (81)	421 (88)*	443 (87)	238 (83)
Two or more	360 (45)	133 (41)	227 (48)	243 (48)*	116 (40)
Three	55 (7)	16 (5)	39 (8)	41 (8)	14 (5)

**P<0.05 for comparisons by sex and age category*

Table 3. **Factors independently associated with awareness of two or more warning signs and risk factors for stroke among respondents aged 45 years and older.**

Factor	Odds ratio (95% confidence interval)
Knowledge of 2 or more warning signs	
Sex (female)	2.02 (1.46-2.80)
Age (45-64 years)	2.44 (1.78 -3.46)
Education level (>12 years)	1.96 (1.08-3.56)
Atrial fibrillation	.77 (.46-1.29)
Diabetes	.92 (.48-1.76)
High blood pressure	.94 (.67-1.33)
High cholesterol	1.68 (1.17-2.42)
History of heart disease**	1.54 (.84-2.83)
History of stroke or TIA	1.20 (.62-2.32)
Current smoker	1.00 (.63-1.59)
Former smoker	1.13 (.79-1.61)
Knowledge of 2 or more risk factors	
Sex (female)	1.48 (1.07-2.05)
Age (45-64 years)	1.35 (1.01-1.81)
Education level (>12 years)	.75 (.41-1.35)
Atrial fibrillation	.75 (.46-1.22)
Diabetes	1.50 (.82-2.74)
High blood pressure	1.19 (.87-1.62)
High cholesterol	1.11 (.81-1.52)
History of heart disease**	1.23 (.71-2.10)
History of stroke or TIA	1.39 (.76-2.52)
Current smoker	1.18 (.78-1.78)
Former smoker	1.16 (.85-1.60)

**Referent groups include: males, respondents aged 65 years and older, respondents with less than 12 years of education, respondents without a history of atrial fibrillation, diabetes, high blood pressure, high cholesterol, heart disease, stroke or TIA, and respondents who reported never smoking cigarettes.*
***Includes heart attack, angina, or coronary heart disease*

more stroke risk factors compared to men and to older respondents aged 65 years and older.

Overall, the majority of respondents (76%) indicated they would call 911 emergency medical services if they witnessed someone having a stroke (Table 4). There were no differences by age, sex, or years of education in the proportion of respondents who indicated they would call 911 if they witnessed someone having a stroke (data not shown). When asked what they would do if they were experiencing sudden difficulty speaking, numbness, or weakness or paralysis, fewer individuals indicated they would call 911 (43% to 49%). Depending on the specific symptom, 17% to 23% indicated they would go to the hospital, 14% to 19% would call their doctor, 11% to 18% would call their spouse or a family member, and 3% to 5% would do something else (Table 4). Respondents aged 65 years and older were more likely to indicate they would call 911 if they experienced sudden difficulty speaking (49% vs. 42%, p = 0.04), numbness (50% vs. 40%, p = 0.006), or weakness or paralysis (55% vs. 45%, p = 0.004) compared to respondents aged 45 to 64 years old. There were no differences in the proportion of respondents who indicated they would call 911 if they experienced any of these warning signs, by sex, or years of education (data not shown).

DISCUSSION

The majority of respondents from the two Montana counties were aware of the warning signs for stroke. Awareness was higher in women, younger respondents, those with a higher level of education, and those with a history of high cholesterol compared to respondents without these characteristics. Interestingly, respondents with a history of other major stroke risk factors (e.g., atrial fibrillation and high blood pressure) were no more aware of the warning signs compared to those without these conditions. Although awareness of signs and symptoms was relatively high, knowledge of stroke risk factors was generally less. And the majority responded that they would call 911 if they thought someone was having a stroke, but less than half would call 911 if they were experiencing stroke warning signs.

Table 4. **Reactions to witnessing a potential stroke, and to experiencing potential warning signs of a stroke, among respondents aged 45 years and older.**

		If you experienced sudden...that would not go away, what is the first thing you would do?		
	If you thought someone was having a stroke, what is the first thing you would do?	Difficulty speaking	Numbness, tingling, or dead sensation	Weakness or paralysis
	n (%)	n (%)	n (%)	n (%)
Take them/go to the hospital	121 (15)	132 (17)	176 (22)	186 (23)
Tell them to/call your/their doctor	21 (3)	121 (15)	150 (19)	110 (14)
Call 911	608 (76)	354 (44)	346 (43)	388 (49)
Tell them to/call spouse or family member	4 (1)	147 (18)	92 (12)	88 (11)
Do something else	38 (5)	38 (5)	32 (4)	25 (3)
Do not know	8 (1)	8 (1)	4 (1)	3 (0)

The findings from this survey should alert clinicians in Montana to recognize and educate patients at high risk for stroke not only about how to prevent and recognize stroke but also about the importance of seeking prompt treatment. Montana's stroke prevention activities are recognized as a model for rural states, and this survey represents the beginning of a regional collaboration to promote community awareness, increased use of EMS and to define regional approaches for prompt stroke treatment[5].

REFERENCES

1. National Institute of Neurological Disorders and Stroke. Tissue plasminogen activator for acute ischemic stroke. The National Institute of Neurological Disorders and Stroke rt-PA Stroke Study Group. N Engl J Med 1995;333(24):1581-7.
2. Morgenstern LB, Bartholomew LK, Grotta JC, Staub L, King M, Chan W. Sustained benefit of a community and professional intervention to increase acute stroke therapy. Arch Intern Med 2003;163(18):2198-202.
3. Morgenstern LB, Staub L, Chan W, Wein TH, Bartholomew LK, King M, Felberg RA, Burgin WS, Groff J, Hickenbottom SL, Saldin K, Demchuk AM, Kalra A, Dhingra A, Grotta JC. Improving delivery of acute stroke therapy: The TLL Temple Foundation Stroke Project. Stroke 2002;33(1):160-6.
4. Greenlund KJ, Neff LJ, Zheng ZJ, Keenan NL, Giles WH, Ayala CA, Croft JB, Mensah GA. Low public recognition of major stroke symptoms. Am J Prev Med 2003;25(4):315-9.
5. Blades LL, Oser CS, Dietrich DW, Okon NJ, Rodriguez DV, Burnett A, Russell J, Allen MJ, Fogle CC, Helgerson SD, Gohdes D, Harwell TS. Rural community knowledge of stroke warning signs and risk factors. Prev Chronic Dis. In press 2005.

CARDIOVASCULAR HEALTH SUMMIT, BIG SKY, MONTANA – FRIDAY, APRIL 8, 2005

The Montana Cardiovascular Health Program's Annual Cardiovascular Health Summit will be held on Friday, April 8, 2005 at Big Sky. This year's conference will include sessions on physician involvement in cardiac rehabilitation and prevention programs, clinical trials in heart failure, and omega-3 fatty acids. James Prochaska will be the keynote speaker. For more information or to register please contact Premier Planning at 406-442-4141 or e-mail Gail Brockbank at gailb@mt.net.

WHAT ARE THE MONTANA DIABETES PREVENTION AND CARDIOVASCULAR HEALTH PROGRAMS AND HOW CAN WE BE CONTACTED?

The Montana Diabetes Control and Cardiovascular Health Programs are funded through cooperative agreements with the Centers for Disease Control and Prevention, Division of Diabetes Translation (U32/CCU822743-02), the Division of Adult and Community Health (U50/CCU821287-02) and through the Montana Department of Public Health and Human Services.

The mission of the Diabetes Control and Cardiovascular Health Programs is to reduce the burden of diabetes and cardiovascular disease among Montanans. Our web pages can be accessed at http://ahec.msu.montana.edu/diabetes/default.htm and http://montanacardiovascular.state.mt.us.

For further information please contact us at:

Diabetes Program Manager:
Elizabeth "Liz" Johnson, RN, CNP
Phone 406/444-0593
e-mail lizj@state.mt.us

CVH Program Manager:
Crystelle Fogle, MS, MBA, RD
Phone 406/947-2344
e-mail cfogle@state.mt.us

Diabetes Quality Improvement Coordinator:
Janet McDowall, RN
Phone 406/248-1270
e-mail jmcdowall@state.mt.us

Epidemiologist:
Carrie Oser, MPH
406-444-4002
e-mail coser@state.mt.us

Diabetes Education Coordinator:
Marcene Butcher, RD, CDE
Phone 406/578-2075
e-mail marcibutcher@msn.com

Project Assistant:
Susan Day
Phone 406/444-6677
e-mail sday@state.mt.us

CVH Admin. Assistant:
Ann Bay
Phone 406/444-5508
e-mail ebay@state.mt.us

The Montana Department of Public Health and Human Services attempts to provide reasonable accommodations for any known disability that may interfere with a person participating in any service, program or activity of the department. Alternative accessible formats of this document will be provided upon request. For more information, call (406) 444-6677 or TDD: 1 (800) 253-4091. Three thousand, eight hundred copies of this public document were published at an estimated cost of $.30 per copy for a total cost of $1,152 which includes $1,152 for printing and $.00 for distribution.

MONTANA CLINICAL COMMUNICATION & SURVEILLANCE REPORT

MONTANA
CARDIOVASCULAR HEALTH AND DIABETES PROGRAMS
720

Montana Department of Public Health and Human Services
Chronic Disease Prevention and Health Promotion Program
Room C314, Cogswell Building
PO Box 202951
Helena, Montana 59620-2951